case of the current sensor in accordance with figure 1. Given a deviation δ in the phase delay φ of the $\lambda/4$ segment of 90°, the reflection interferometer behaves like a Sagnac interferometer with two identical $\lambda/4$ segments whose axes are aligned parallely. The current-induced differential phase shift is then approximately

$$\Delta\Phi'_R \approx \Delta\Phi_R [1+ \delta^2/2) \qquad (9).$$

$\Delta\Phi_R$ is given by equation (2). If the temperature dependence of the phase delay of the $\lambda/4$ segment is -0.0153°/°C, as in the above example, the phase delay angle is to be set to 105° at room temperature, and the length L of the segment is to be selected correspondingly in order to achieve compensation of the temperature dependence of the Verdet's constant V.

IN THE CLAIMS:

Kindly replace Claims 1-9 with the following:

1. (Twice Amended) A fiber optic current sensor, comprising:

a coiled sensor fiber which encloses a current conductor (S), and at least one phase delay element adjoining the sensor fiber, wherein the at least one phase delay element has a phase delay with a temperature dependence which at least approximately compensates for a temperature dependence of a Verdet's constant (V) of the sensor fiber.

2. (Twice Amended) The current sensor as claimed in claim 1, wherein the at least one phase delay element has a phase delay angle whose value deviates from a phase delay angle of an ideal phase delay element.